

MESSAGING SYSTEM FOR MOBILE COMMUNICATION

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Field of the Invention (Technical Field):

The present invention relates to a messaging system to improve message transmission efficiency, speed, and accuracy from a mobile communication device.

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There are a variety of mobile communication devices available for wireless, or remote, communications, such as mobile telephones and pagers, hereinafter referred to as "mobiles". Mobiles typically comprise a rigid housing enclosing a printed circuit board, an associated microprocessor, electronic and electro-acoustic components, and a portable power supply such as a battery. Mobiles communicate through a variety of means, including antennas which transmit and receive radio frequency (RF) signals, infrared (IR) emitters and receivers, and cable connections to input/output ports on computers or to other mobiles. The user interfaces with the circuitry and microprocessor of the mobile through a keypad, or touchpad, located on the front outer surface of the housing. Keys on the keypad are pressed by the user to temporarily close an internal switch and send a signal to the microprocessor of the mobile where an appropriate routine processes the input and activates the mobile. On mobile telephones, graphical elements, such as alphanumeric characters and icons, are located on or near the keys of the keypad to guide the user in interfacing with the mobile. For example, keys are identified with the numbers 0-9, letters of the alphabet, and the pound and asterisk symbols. A display on the mobile housing provides readouts of data input by the user, access to spatially-navigated menu trees, graphical user interfaces (GUIs), windows, and messaging.

As mobile designs have advanced, more features are provided to the user, such as the ability to program, store and transmit information to other mobiles, computers, servers, and over the Internet.

Typically, spatially-navigated menus shown on the display aid the user in inputting data, and also aid the user in accessing data for revision or transmission. To make use of these features requires an increasing number of keystrokes and more detailed information on the display for the user to interface with the mobile. On mobile telephones specifically, more features have led to the need for more keys.

- 5 As the number of keys on the keypad of mobile telephones has increased, the density of the keys within a given surface area has increased and the size of each key has decreased. Key spacing is further compromised as mobiles are made more compact to reduce weight and improve portability.

- Due to the size of mobiles and the limited amount of key space on such devices, it is often difficult
- 10 to enter data or text messages into a mobile in an efficient manner. For example, to enter a textual message on a mobile telephone, the user typically accesses the appropriate message menu offered in the menu hierarchy and then keys in the textual data by pressing the alphanumeric keys of the keypad. Often, the key must be pressed more than once to input the correct letter as one key may represent as many as three letters. For example, the same key may represent the number "2" as well as the three
- 15 letters "A," "B," and "C." Further, most mobile telephones limit the number of characters per message, requiring the user to express the message as succinctly as possible. The increased number of functions performed by each key, and the limited number of characters available per message, further contribute to the cumbersome nature of entering and transmitting a textual message. In order to increase message entry efficiency, users often resort to shorthand to relay the message, for example, "IC" may be entered
- 20 to represent "I see."

- To improve the efficiency of text message transmission between mobiles, a variety of "short message systems" (SMS) have been designed for rapid text entry. Early applications of SMS were used by telephone operators to alert subscribers to newly received voice mail messages or stored facsimiles
- 25 by displaying a simple message on the mobile display that the user saw once the mobile was turned on. Later applications of SMS provide users with a list of default messages that are chosen by a single keystroke in order to be sent, for example, "please call home." Upon choosing the predefined message, the sending mobile automatically sends it to the receiving mobile. Short message systems have been

implemented for the transmission of messages from the Internet, computers, and from messaging services of communication service providers. One advantage of an SMS is that the receiving mobile need not be active in order to receive the message. The sent message is stored in the communication system until the receiving mobile is switched to the "On" position. The message is then automatically
5 received, stored on the receiving mobile, and displayed on its screen.

Difficulties with present SMS systems include the inability to edit or revise the predefined messages stored in the system to communicate a more precise message. Another difficulty arises when the message is transmitted in a single language. With increased global communication, it would be
10 useful if messages could be received in a selected language. Prior art systems do not provide this capability.

An efficient method of transmitting messages between users of mobiles is needed where the number of keystrokes is minimized and the ability to tailor the message is preserved. The ability to send
15 messages in a particular language is also needed. Accordingly, there is a need to be able to customize and translate predefined messages into other languages for enhanced communication between mobile users.

SUMMARY OF THE INVENTION (DISCLOSURE OF THE INVENTION)

20 A primary object of the present invention is to provide a messaging system for mobiles where the user is provided predefined messages, as well as messages that can be customized. Another object of the present invention is to provide messages in a base language and the ability to transmit the messages to a receiver in a selected language. Another object of the present invention is to minimize keystrokes required to transmit a message. Still another object of the present invention is to minimize the amount of
25 data required to transmit a message.

The present invention is a messaging system for mobiles where predefined messages can be selected and customized by the user for transmission to the receiver. The predefined messages can be

customized by entering the desired text at predetermined locations within each message. The invention also provides the predefined messages in a variety of languages so that the user can select the message to be sent in a base language and request that the message be translated into another language for transmission to the receiver. The invention also allows the user to select from a contact list those recipients who are to receive the transmitted message; the mobile then transmits the message to every recipient selected from the list.

A primary advantage of the present invention is improved efficiency in message communication due to the decreased number of keystrokes required to enter the selected message into the mobile to be transmitted. Another advantage of the present invention is that predefined messages can be customized by entering text at predetermined locations within each message. Still another advantage of the invention is the ability to have the message transmitted to the receiver in a selected language. Yet another advantage of the present invention is the ability to transmit a message to a plurality of recipients. Still yet another advantage of the present invention is the ability to transmit messages with a minimal amount of data in the transmission. The present invention provides simple, fast, and accurate communications irrespective of the language used.

Other objects, advantages and novel features, and further scope of applicability of the present invention will be set forth in part in the detailed description to follow, taken in conjunction with the accompanying drawings, and in part will become apparent to those skilled in the art upon examination of the following, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and attained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated into and form a part of the specification, illustrate preferred embodiments of the present invention and, together with the description, serve to

explain the principles of the invention. The drawings are only for the purpose of illustrating preferred embodiments of the invention and are not to be construed as limiting the invention. In the drawings:

Fig. 1 is a flow diagram demonstrating the method of the preferred embodiment of the messaging system of the present invention;

Fig. 2 is a flow diagram demonstrating the voice-recorded message feature of the messaging system of the present invention;

Fig. 3 is a diagram demonstrating a list of examples of predefined and customizable messages, available translation languages and the second embodiment of the transmission methodology of the present invention;

Fig. 4 is a diagram depicting a list of predefined messages, available translation languages, and the third embodiment of transmission methodology of the present invention; and

Fig. 5 is a list of examples of defined contacts/text information for use in accordance with the preferred embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

(BEST MODES FOR CARRYING OUT THE INVENTION)

Referring to Fig. 1, a flow diagram demonstrates the preferred embodiment for the messaging system of the present invention. A suitable routine operating in the microprocessor of the mobile is used to implement the methodology of the messaging system. The mobile transmitter transmits the messages. To operate the system, the user first accesses a menu of messages. To access the messages, the user proceeds through one or more windows, menus, or graphical user interface screens until arriving at the list of messages. Table 1 lists four examples of "predefined" messages accessible to the user of the messaging system. The same examples of predefined messages appear in Fig. 3, which

shows examples of both predefined and customizable messages available to the user, to be described below.

TABLE 1

Message No.	Predefined Message
(1)	"Are you available?"
(2)	"Please contact the office."
(3)	"Will you attend the meeting today?"
(4)	"Please return to the office."

The list of predefined messages shown in Table 1, and also in Fig. 3 at **10**, cannot be customized. These messages are available for rapid communication in the event that the user does not need to customize the message. Returning to Fig. 1, upon selecting the desired predefined message for transmission, such as by navigating to the desired message and selecting it through the "enter" key of the mobile, the messaging system prompts the user to select the recipient or recipients to whom the message is to be transmitted. This prompt includes the option of inputting a particular recipient for message transmission or one or more recipients from a contact list stored on the system. If the user chooses to send the message to a recipient that is not on the mobile contact list, the user inputs the telephone number of the recipient.

Each predefined message is stored in the mobile memory in a variety of languages. After entering the recipient's telephone number, the user is prompted to select a transmission language **12**. (See Fig. 3.) The prompt for selecting a transmission language includes a list of available languages, such as English (A), Spanish (B), German (C), etc. The message is then transmitted in the language that was selected by the user, and the recipient mobile displays the message in the selected language to the recipient.

If the user selects the option of choosing a recipient or recipients from the contact list stored in the mobile memory, the system displays the "defined contacts/text" list **14** (see Fig. 5) and allows the user to select one or more recipients for the message. After each recipient, group list, or all contacts, is selected to receive the message, the system prompts the user to select the transmission language for that recipient, group, or all contacts. Once the user has selected all of the recipients for the message and their associated transmission language, the message is sent to all recipients. Each recipient mobile displays the message in the selected transmission language.

Referring to Fig. 5, the recipients' contact information is stored within list **14** which contains text, phrases, and contact information previously input by the mobile user into memory. For example, once the user chooses to select a recipient or recipients from list **14**, the system displays list **14** from which the user selects a recipient or recipients. The user has a choice of selecting individual names, group lists, or all contacts stored in list **14**. If the system is in the "select recipient" mode, the system automatically inputs the telephone number, or address information, associated with the selected recipient for transmission. Contacts are initially defined by the user and input into the system memory by entering the contact person's name, telephone number, address, and other relevant information into the defined contacts/text list **14** of the mobile memory.

List **14** shown in Fig. 5 includes textual data as well as contact information. The user has the option within the system to input terms and phrases into list **14** in memory for rapid recall and use within a message as will now be described. Returning to Fig. 1, the user has a choice of "customizable" messages to choose from the message list **10**, in addition to the predefined messages. Table 2 provides a list of three example customizable messages made available to the user on the messaging system. (See also Fig. 3.)

TABLE 2

Message No.	Customizable Message
(5)	"Are you available on <u>TEXT/DATE</u> at <u>TEXT/TIME</u> ?"
(6)	" <u>TEXT/DEFINED</u> would like to invite you to <u>TEXT/DEFINED</u> ."
(7)	"Please call <u>TEXT/DEFINED</u> regarding <u>TEXT/DEFINED</u> ."

Each customizable message available to the user contains a predefined portion and one or more customizable text entry portions. If the user chooses a customizable message, the user navigates to each customizable text entry location within the message in order to enter the customized information. There are three basic types of customized information that the user can input: (1) "text," which is input by the user one character at a time on the mobile keypad, (2) "defined," which is contact or textual information previously defined by the user and stored in defined contacts/text list 14 in memory (see Fig. 5), or (3) "default," such as the current date or time, as appropriate to the context of the message, or a date or time that the user selects from the system calendar or clock. For example, referring to Fig. 3, if the user selects customizable message No. 5, the user is first prompted to enter either textual information 16 or default information 18, such as a date or time, at the first customizable location 20 within the message. To choose "text" or "default," the user navigates, with the appropriate navigation key, to either "text" or "default" and strikes the "enter" key. If the user chooses to input text into customizable location 20, the user keys in the information one character at a time through the mobile keypad. If the user chooses to input default information 18 in the first customizable location 20 of message No. 5, the system offers the user the choice of, in this instance, the present date, or offers the user the option to select a date from the system calendar. Once customizable location 20 is completed, which is accomplished with the "enter" key, the user enters the information and the system moves to the next customizable location 22 within the message. The user is then prompted to enter either textual information 24 or default information 26 at customizable location 22. If the user chooses to input text 24, the user keys in each character of text until completed. If the user chooses to input default

information **26**, the system automatically offers the user a choice of times, such as 11:00 a.m., 12:00 p.m., 1:00 p.m., etc. from the system calendar.

Referring to customizable message No. 6 of Table 2 and Fig. 3, two text entry locations **28** and **30** are provided for the user to customize. Upon selecting customizable message No. 6, the user is first prompted to enter either text **32** or defined information from list **14**. If the user chooses text **32**, the user keys in each character of the textual information for the message. If the user chooses defined information, the system displays defined contacts/text list **14** of Fig. 5. The user then selects the defined information from list **14**. For example, the user may choose to enter a contact name into text entry location **28**. Alternatively, the user may choose to input a defined term or phrase that the user previously stored in list **14** in memory, for example, "Discussion Group 3." After entering the customized information into location **28** of customizable message No. 6, the user is prompted to complete entry location **30** of customizable message No. 6. The user again has the option of keying in text **34** or selecting defined information from defined contacts/text list **14**. For example, if the user chooses to enter defined information, the user can select a phrase from list **14** at **54** (see Fig. 5), such as "our Thursday meetings". Because the system is in the customizable message entry mode, should the user choose a contact name or list of names for location **28** or **30**, the system automatically enters only the contact name, or group name, into the entry location, and disregards the associated address and telephone information associated with that name. Customizable message No. 7 also offers two customizable locations **36** and **38** to be completed by the user in a similar manner. It will be understood that a variety of predefined and customizable messages are included within the teachings of the present invention.

Once the customizable message is complete, the system prompts the user to select a recipient or recipients to receive the message. The user then selects a recipient or recipients from the defined contacts/text list **14** (see Fig. 5), or inputs a particular recipient's telephone number. After each recipient, or group of recipients, is entered, the system prompts the user to select a transmission language for the message. The system then translates those predefined portions of the customizable message outside of the customizable locations into the selected transmission language. Default information, such as dates

and times, is also translated into the selected language. Optionally, the system also includes a feature of translating individual words into other languages, and in this instance also translates as many words as possible from the customized locations, including defined information and text, into the selected transmission language. Once all of the recipients have been named and the transmission language
5 selected for each, the customized message is sent to each recipient.

The system also enables the user to concatenate a series of text, defined, and default information into a completely customized message, as shown by message No. 8 at **40** in Fig. 3. The user is continually prompted to enter either text, defined, or default information until the message is complete.

10 For example, the user is first prompted to enter either text, defined, or default information at entry location **42**. As described above, if the user chooses to enter text information, the user keys in each individual character until complete. If the user chooses to enter defined information, the system provides the defined contacts/text list **14** (Fig. 5) from which the user can choose a name, group of names, terms, or phrases. If the user chooses default for entry location **42**, then the system provides the system
15 calendar to the user so that a date, day of the month, or time can be selected for entry. By allowing the user to concatenate message data in this manner through customizable locations **42**, **44**, and **46**, as shown at customizable message **40**, the user can input a detailed message in a rapid and efficient manner.

20 Referring to Fig. 2, a flow diagram depicts a recorded-voice message feature of the present invention for a system applicable in particular to mobile telephones. This feature allows a user to record a voice message, or other acoustic message, for transmission to a plurality of recipients, rather than keying in a text message. The user first accesses the record voice message feature in the mobile through a menu hierarchy, graphical user interface, or otherwise, and is then prompted by the system to
25 record the voice message. Upon completion of the voice message, the system prompts the user to select the recipient or recipients for receiving the message. The user can either select recipients from the defined contacts/text list **14** (Fig. 5) or input a particular recipient's telephone number directly. Because the system is in the select recipients mode, the system automatically inputs the associated

telephone number along with the recipient if selected from the defined contacts/text list **14**. Once all recipients have been selected for receiving the recorded voice message, the message is sent by the system to all selected recipients. This feature is particularly useful for recording a message that must be sent to a large number of recipients. For example, the user may record the voice message and then

5 select a group list of recipients from the defined contacts/text list **14**, where the group list contains many recipient names and telephone numbers. This reduces to a single call the number of telephone calls that the user would make with a prior art system. The system transmits the voice message to each recipient telephone number automatically. The recipient mobile then receives an indication that a voice message has been transmitted and the recipient mobile user can then access the voice message through the

10 recipient mobile. The user has the option of transmitting the voice message directly to the recipient's voice mail, or the user can transmit the voice message to the recipient by dialing the recipient number, and playing the recording when the recipient answers the telephone.

There are three transmission methodologies through which the messaging system can be

15 implemented. In the first transmission embodiment, message information is transmitted over conventional communication links, such as through a cable connection, or through a wireless connection such as an encoded RF signal, or infrared signal. Message information is transmitted directly from the sending mobile to the receiver, the receiver being another mobile, a computer, a server, or the Internet.

In a second embodiment, an intermediate server **48**, shown in Fig. 3, is used to decode and transmit message information from the sending mobile **50** to the recipient mobile **52**. In this embodiment, sending mobile **50** transmits the predefined messages by code to server **48**, which decodes the code and transmits the textual information to recipient mobile **52**. The predefined messages are programmed into the server to correspond to the predefined messages stored in all

20 mobiles operating in the system. For example, if the user selects predefined message No. 2 from message list **10** to be transmitted in language A from the list of available language translations **12**, sending mobile **50** transmits the code "2, A" along with the recipient's telephone number to server **48**. Server **48** is preprogrammed to decode "2, A" into the message "please contact the office" in English for

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transmission to recipient mobile **52**. In this embodiment, all mobiles sending messages are operated through intermediate server **48**, thereby reducing the amount of data that must be transmitted from the sending mobile **50** to server **48**. Mobiles receiving messages may optionally be operated through intermediate server **48**. In this embodiment, customizable messages are also transmitted according to a message and language code, along with the information input by the user into the customizable locations of the customizable message.

In a third embodiment of the transmission methodology of the present invention, similar to the second embodiment, all mobiles operate in a closed system. Referring to Fig. 4, a diagram depicts a list of predefined messages **10**, available translation languages **12**, and the closed mobile communication system through which the messaging system is implemented. In this embodiment, all mobiles are programmed with the same messages **10** and language translations **12**. Messages are transmitted directly from sending mobile **50** to recipient mobile **52** with a minimal amount of data bits because all predefined messages are identical and are identically coded.

In the simplest example, referring to Fig. 4, if the user chooses to send predefined message No. 2 in language A, sending mobile **50** transmits the code "2, A" to recipient mobile **52**, which then displays predefined message No. 2 in language A to the recipient. Optionally, default information and defined contacts/text lists are also identical on each mobile in the system, and each piece of information is coded identically. Then, should the user of sending mobile **50** select a customizable message such as message No. 5 (see also Fig. 3), in language B, sending mobile **50** transmits the message code "5, B" along with the code for the customized defined or default information input by the user of sending mobile **50** into the customizable locations in the customizable message. The second and third embodiments of the transmission methodology depicted in Fig. 3 and Fig. 4 are particularly applicable to closed mobile communication systems such as when all mobile users are within a single business environment where mobile users communicate with a common and familiar set of messages.

It will be understood that information such as the predefined message list **10** and the defined contacts/text list **14** can be downloaded from another system, such as a computer, the Internet, or a personal digital assistant (PDA). While simplified examples are depicted in the figures showing the preferred embodiments of the present invention, it will be understood by those skilled in the art that a variety of modifications to the system as depicted are within the teachings of the present invention.

Although the invention has been described in detail with particular reference to these preferred embodiments, other embodiments can achieve the same results. Variations and modifications of the present invention will be obvious to those skilled in the art, and the appended claims are intended to cover all such modifications and equivalents.